Remarks/Arguments

The Examiner is thanked for the careful review of this application. A Request for Continued Examination (RCE) is being filed under 37 CFR § 1.114 along with this Amendment.

Claims 1-16 and 21-25 are pending after entry of the present Amendment. Claims 2 and 17-20 were cancelled. New claims 24-25 were added. No need subject matter has been introduced.

Rejections under 35 U.S.C. § 103:

The Office has maintained rejection of claims 1, 3-16, and 21 under U.S.C. 103(a) asserting that it would have been obvious to one with ordinary skill in the art to use the two-step etching and endpoint detection of Chiu in the process of Nguyen to arrive at the claimed invention. For the following reasons, Applicants respectfully submit that contrary to the Office's assertion, one of ordinary skill in the art would not have arrived at the claimed invention, as defined in amended independent claims 1, 6, 7, and 21 and the new claims 22-25.

First, it is submitted that none of the cited art of record teach implementing a second etchant gas that is highly selective toward the material of the spacer layer. Rather, Nguyen teaches that if a second etch operation is performed, the second etchant gas has a low selectivity to the underlying layer (i.e., selectivity of 2:1 as to silicon nitride with respect to silicon dioxide). See column 6, lines 47-52. Such deficiency in Nguyen cannot be cured by Chiu, as Chiu also fails to teach using a second etchant gas that is highly selective, as defined in the claimed invention.

Second, assuming that the second etchant gas of Chiu is taught to be highly selective toward the material of the space layer (a proposition with each Applicants disagree), using the highly selective second etchant gas in Nguyen would render the spacer etch method of Nguyen unsatisfactory for forming a spacer of a gate structure. Nguyen specifically teaches using an etchant gas having low selectivity to have a margin of error for stopping the etching process directed at removing the nitride spacer layer before etching the substrate. In this manner, Nguyen uses the silicon dioxide layer merely as a sacrificial layer portions or all of which can be etched so long as the underlying substrate is not exposed. In the claimed invention,

however, by using the highly selective second etchant gas, precautions are taken so that etching through the silicon dioxide layer is minimal.

Furthermore, it is respectfully submitted that none of the cited art of record teach or suggest using any of the combination of chemicals implemented in the first or second etchant gases, as defined in the claimed invention (e.g., new claims 23-25). Nguyen teaches using etching recipes wherein both the first etchant gas and the second etchant gas include He. *See* column 5, lines 27-30). In the same manner, Chiu specifically teaches that the first etchant gas and the second etchant gas preferably employ a chlorine containing etchant gas composition. *See* column 7, lines 14-27. The claimed invention, however, uses the combination of C_2F_6, CH_2F_2, and O_2, a combination of CF_4, CH_2F_2, and O_2, or a combination of CF_4, HBr, and O_2 as the first etchant gas, and a combination of C_2F_6, CH_2F_2, or O_2 or a combination of O_2, HBr, and SF_6, as the second etchant gas. As can be seen, none of the chemicals used in Nguyen or Chiu use or suggest using any of the combinations defined in the claimed invention.

Yet further, Applicants submit that in contrast to the Office's contention, etch processes disclosed in Nguyen and Chiu do not monitor the etch process by OES method and discontinue the etch process after a predetermined period of time, as defined in the claimed invention. As stated above, Nguyen uses the signal generated by spectrometer in response to light emission intensity of the plasma to determine etch endpoint. As a result, the length of etch process can vary as what is measured and detected by the spectrometer is not related to time. In the same manner, Chiu stops etching once the substrate surface is reached and not when the etch process is performed for a predetermined period of time. Again, the period of time that may take to reach the substrate can vary due to variation in wafer thickness.

Still further, Applicants respectfully submit that one of ordinary skill in the art reading Nguyen would not have been motivated to arrive at using a non-IEP endpoint detection process to monitor the second etch process, as other non-IEP etch endpoint detection methods may not detect the etch endpoint when He is used. Additionally, one of ordinary skill in the art would not have disregarded the solution set forth in Nguyen (i.e., increase the level of He) to search for a remedy in a different reference and a different etch endpoint detection method.

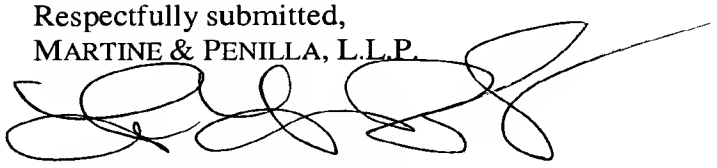
Additionally, the first etch process of Nguyen uses OES etch endpoint detection, and as such, cannot be stopped when merely a specific portion of the spacer layer has been

removed. In short, optical spectrometry endpoint detection cannot provide any information as to the thickness of the remaining thin spacer layer.

Therefore, it is respectfully submitted that independent claims 1, 6, 7, and 21-25 are patentable under 35 U.S.C. § 103(a) over any combination of the cited prior art. In a like manner, dependent claims 3-5 and 8-16 which incorporate each and every element of the applicable independent claim are patentable under 35 U.S.C. § 103(a) over any combination of the cited prior art for at least the same reasons discussed above.

In view of the foregoing, Applicants respectfully submit that all of the pending claims 1-16 and 21-25 are in condition for allowance. Accordingly, a Notice of Allowance is respectfully requested. If the Examiner has any questions concerning the present Amendment, the Examiner is kindly requested to contact the undersigned at (408) 749-6900, ext. 6913. If any additional fees are due in connection with filing this Amendment, the Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. LAM2P295). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
MARTINE & PENILLA, L.L.P.



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